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- (71) Applicant: **G.D S.P.A.** [IT/IT]; Via Battindarno, 91, I-40133 Bologna (IT).
- (72) Inventors: **BONZI, Claudio**; Via Murri, 126, I-40127 Bologna (IT). **ANSALONI, Andrea**; Via Puccini, 9, I-40033 Casalecchio di Reno (Bologna) (IT).
- (74) Agent: **BIANCIARDI, Ezio**; c/o BUGNION S.p.A., Via di Corticella, 87, I-40128 Bologna (IT).

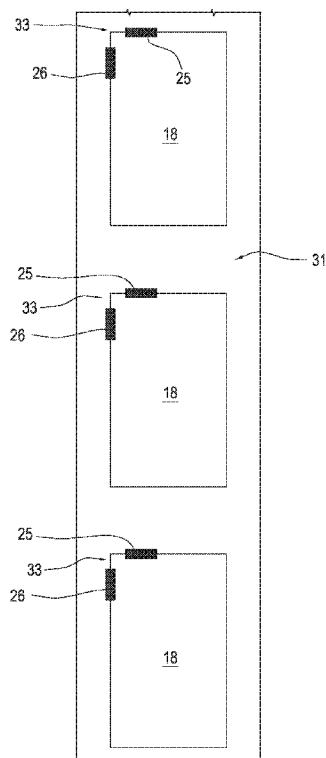
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[Continued on next page]

(54) Title: METHOD FOR CHECKING THE POSITION OF AN ADHESIVE LABEL ON A SHEET MATERIAL

FIG.7



(57) Abstract: Described is a method for checking the position of an adhesive label on a sheet material, the sheet material forming or being designed to form, in particular, a wrapper (3) forming part of a packet (1) of cigarettes, and the label (18) being applied to the sheet material after its separation from a web (31); the method comprises, before separation of the label (18) from the web (31), the printing on the label (18) of at least a centering mark (33) extending as far as the outer perimeter of the label (18); the check of the position of the label (18) on the sheet material occurring through the detection of the position of the part of the perimeter of the label (18) on which the centering mark (33) extends.

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**DESCRIPTION**  
**METHOD FOR CHECKING THE POSITION OF AN ADHESIVE LABEL**  
**ON A SHEET MATERIAL**

**Technical field**

This invention relates to a method for checking the position of an adhesive label on a sheet material.

More specifically, this invention relates to a method for checking the  
5 correct positioning of an adhesive label applied to sheet material forming  
or designed to form an inner wrapper in a container such as a packet of  
cigarettes of the "sealed" type.

In the description which follows, reference is made, by way of example, to  
containers, in particular of the rigid type, consisting of packets of  
10 cigarettes, without thereby restricting the scope of the invention.

**Background art**

Rigid, hinged-lid packets for cigarettes are currently the cigarette packets  
of the most widespread type on the market because they are simple to  
15 make, easy and practical to use and provide good mechanical protection  
for the cigarettes they contain.

Normally, a rigid, hinged-lid packet for cigarettes comprises a hollow  
container having an extraction opening at the top of it for taking out the  
cigarettes and a lid which has a downward facing concavity and which is  
20 joined to the container along a hinge allowing it to rotate relative to the  
container itself between a position where the opening is open and a  
position where it is closed.

The container houses an inner wrapper, usually made of metallized paper  
and wrapped around a group of cigarettes.

25 To better protect the tobacco in the cigarettes, it is frequent to make  
cigarette packets, commonly known as "sealed packets", where the inner  
wrapper has an opening for extracting the cigarettes and is provided with a

re-positionable label with a tab which can be held between two fingers and pulled in order to move part of the label away from the inner wrapper. The label usually covers a large part of the top of the packet and an upper portion of the front wall of the inner wrapper and is provided with spots of adhesive material which allow it to be placed in a closed position several times after every extraction of a cigarette from the inner wrapper.

Once the labels have been applied to the inner wrappers, during the production of the cigarette packets, it is necessary to check that their position is correct relative to the opening to be used for extracting the cigarettes.

Usually, this check is performed using control devices of the optical type, which identify on each label the position of a printed ornamental pattern and compare a parameter relating to the position detected with a sample parameter to determine, even quantitatively, any deviations in the position of the label relative to the correct position.

This operating method is inadequate if the labels are only printed with ornamental patterns having muted colours or with colours having little contrast with the background of the label, since, in these cases, the control devices are unable to easily identify the edge zones of the ornamental patterns.

In order to overcome this problem, use is sometimes made of the practice of printing reference marks (eyemarks) on the labels, having features which can be easily detected by the control devices of the optical type.

However, even this practice does not constantly lead to satisfactory results, since it has been found that the position tolerances of the reference marks on the material in the form of a web from which the labels are made are very high, even reaching values close to a millimetre, and a position error of the label of that extent relative to the opening designed for extracting cigarettes from the inner wrapper of a packet of cigarettes is considered absolutely unacceptable.

**Disclosure of the invention**

The aim of this invention is to provide a method for checking the position of an adhesive label on a sheet material, in particular forming an inner wrapper of a container such as a packet of cigarettes of the "sealed" type, which is capable of overcoming the drawbacks described above with reference to the prior art.

The invention accordingly provides a method for checking the position of an adhesive label applied to sheet material as described in one or more of the appended claims.

10 More specifically, according to this invention, a method is provided for checking the position of an adhesive label on a sheet material, the sheet material forming or being designed to form, in particular, a wrapper forming part of a packet of cigarettes, and the label being applied to the sheet material after its separation from a web; the method comprises, before separation of the label from the web, the printing on the label of at least a centering mark extending as far as the outer perimeter of the label; the check of the position of the label on the sheet material occurring through the detection of the position of the part of the perimeter of the label on which the centering mark extends.

20 In this way, the centering mark highlights the contrast of the outer perimeter of the label relative to the sheet material which forms the background. In other words, the centering mark optimises the contrast between the sheet material and the perimeter of the label, and the latter is used as a position marker in the control process.

25 Preferably, during the printing process, the centering mark of the label projects onto the web beyond the outer perimeter of the label.

Preferably, the centering mark of the label comprises at least one perimetric edge coinciding with a respective perimetric edge of the label.

Preferably, the centering mark comprises a first and a second centering eye mark, the eye marks extending, respectively, as far as a first and a second perimetric edge of the label; the first and second perimetric edges

starting from a same vertex of the label.

Preferably, the centering mark comprises a first and a second centering eye mark, the eye marks extending, respectively, as far as a first and a second perimetric edge of the label; the first and second perimetric edges  
5 being at right angles, or substantially at right angles, to each other.

In that way, the control process may comprise a check of the position of the label according to two orthogonal directions, that is, according to two Cartesian axes on the plane on which the label lies.

Alternatively, it may be preferable that the centering mark comprises a  
10 single centering eye mark, extending as far as a vertex of the label formed by a first and a second perimetric edge of the label. In that case, it is preferable that the single centering eye mark has a substantially triangular shape or is substantially "L" shaped. In this case, it is preferable that the perimetric edges which define the vertex of the label are at right angles to  
15 each other, in such a way that the control process can comprise a check of the position of the label according to two orthogonal directions, that is, according to two Cartesian axes on the plane on which the label lies.

It is also preferable that the centering mark be printed using invisible ink, that is to say, not visible by the human eye with sources of light in the field  
20 of vision. In that case, it is preferable that the centering mark be printed using an ink which is visible under lighting within the ultraviolet or infrared range.

### **Brief Description of the Drawings**

25 This invention is described below with reference to the accompanying drawings, which illustrate a non-limiting embodiment and in which:

- Figures 1 and 2 show respective perspective views of a cigarette packet comprising an inner wrapper of a sealed type equipped with a repositionable adhesive label for opening and closing;
- 30 - Figures 3 to 6 illustrate four different embodiments of an adhesive label which can be used in the packet of Figures 1 and 2;

- Figure 7 shows a web from which the adhesive labels of Figures 3 to 6 are made.

### **Detailed Description of the Preferred Embodiments of the Invention**

- 5 With reference in particular to Figure 1, the numeral 1 denotes in its entirety a rigid cigarette packet comprising an outer container 2 and an inner wrapper 3 housed inside the container 2. The packet 1, in the embodiment of Figures 1 and 2, is of the hinged lid type, but it might be of any other type.
- 10 Preferably, the outer container 2 is made of stiff card or paperboard. The outer container 2 has a lid 4 which is joined to the container 2 along a hinge 5 allowing it to rotate relative to the container 2 itself between an open condition and a closed condition and vice versa. In variant embodiments of the invention, the container 2 might house more than one inner wrapper 3, as described for example in patent application
- 15 WO200230790A2. When the packet 1 is in the closed condition, the lid 4 gives the outer container 2 the shape of a rectangular parallelepiped having a top wall 6 and a bottom wall 7 which are parallel and opposite to each other, two large side walls 8 and 9 which are parallel and opposite to each other, defining the front and rear walls of the packet 1, respectively, and two small side walls 10 which are parallel and opposite to each other, defining the respective flanks of the packet 1.
- 20 The lid 4 comprises a front wall 11 which, in the closed condition of the packet 1, forms part of the front wall 8 of the packet 1. The lid 4 comprises two side walls 14 which, in the closed condition of the packet 1, combine to form the respective flanks 10 of the packet 1.
- In the embodiments illustrated in the accompanying drawings and described below, the cigarette packet 1 does not have what is known as the inner frame, but without thereby excluding alternative embodiments, not illustrated, where the packet 1 does have an inner frame.
- 30

The packet 1 comprises a group 15 of cigarettes 16 wrapped in the inner wrapper 3.

At the top and front of it, the inner wrapper 3 has an opening 17 for taking out the cigarettes 16 and is substantially sealed from the outside of the opening 17 so as to maintain the aroma and/or the humidity of the cigarettes 16.

A label 18 allows opening and closing the inner wrapper 3, making it possible to take out the cigarettes 16 through the extraction opening 17.

The label 18 is fixed to the inner wrapper 3 by at least one film, not illustrated, of re-positionable adhesive.

More specifically, the label 18 comprises an inside face, not illustrated, directed towards the group 15 of cigarettes 16, and an outside face 21, directed towards the lid 4.

The inner face of the label 18 has the film of re-positionable adhesive.

When the packet 1 is in the closed condition, the film of adhesive is located around the upper edges and the front edge of the extraction opening 17.

It should be noted that a portion 22 of the precut inner wrapper 3 is (preferably) glued to the inside face (not illustrated) of the label 18, thus sealing in the cigarettes 16. When the packet 1 is opened for the first time, the portion 22 of the wrapper 3 is removed by means of the label 18, thus defining the opening 17 of the inner wrapper 3.

When the packet 1 is in the closed condition, a front edge of the label 18 is associated with a tongue 23 which is located at least partly under the front wall 11 of the lid 4.

The tongue 23 defines a grip tab which facilitates lifting the label 18 from the wrapper 3 to access the cigarettes 16 inside the wrapper 3 and re-positioning the label 18 in contact with the wrapper 3 after taking out a cigarette 16 .

As shown in Figures 3 to 6, the label 18 has, on its surface opposite the surface designed to adhere to the inner wrapper 3, a printed film which, as

will become clearer as this description continues, constitutes a centering mark 33 which may comprise one or two printed marks (eyemarks) shaped and positioned in different ways in Figures 3 to 6.

The centering mark 33 of the label 18 of Figure 3 comprises a single mark 24 printed with a triangular shape, positioned at a vertex of the label 18 (at the top left in Figure 3) and matching the vertex. More specifically, two sides intersecting and perpendicular to each other of the mark 24 are substantially matched with respective sides of the label 18 defining the vertex.

10 The label 18 of Figure 4 is, however, equipped with a centering mark 33 comprising two marks 25 and 26 printed with an elongate shape, perpendicular to each other and positioned near to a vertex of the label 18 (at the top left in Figure 3) lying parallel to the respective sides of the label 18 intersecting and defining the vertex. The mark 25 in Figure 4 lies  
15 horizontally, whilst the mark 26 lies vertically, and a side of each of the marks 25, 26 is substantially matching with a respective side of the label 18 defining the above-mentioned vertex.

The label 18 of Figure 5 is equipped with a centering mark 33 having substantially an "L" shape, comprising two marks 27 and 28 printed with  
20 an elongate shape, perpendicular to each other and concurrent at a vertex of the label 18 (at the top left in Figure 3) lying parallel to the respective sides of the label 18 intersecting and defining the vertex. The mark 27 in Figure 5 lies horizontally, whilst the mark 28 lies vertically, and a side of each of the marks 27, 28 is substantially matching with a respective side of  
25 the label 18 defining the above-mentioned vertex, so that the sides of the marks 27, 28 are perpendicular to each other, and respective ends of the sides of the marks 27, 28 coincide.

The label 18 of Figure 6 is equipped with a centering mark 33 comprising two marks 29 and 30 printed with an elongate shape, perpendicular to  
30 each other and positioned near to respective vertices of the label 18 (positioned on the left, at the top and bottom, respectively, in Figure 6)

lying parallel to respective sides of the label 18 intersecting and defining a vertex positioned at the top left in Figure 6. A side of each of the marks 29, 30 is substantially matching with a respective side of the label 18 concurrent towards the vertex.

- 5 As shown in figure 7, the labels 18 are obtained by cutting and separating, that is to say, removing, from a web 31, on which are printed, relative to each label 18, the centring marks 33 comprising the above-mentioned marks 24-30 (Figure 7 shows marks 25 and 26).

As illustrated, the marks 24-30 are printed across sides or edge zones of the label 18, in such a way as to be present in the label 18 in the ways described with reference to Figures 3 to 6, and to also touch portions of the web 31 close to the sides or edge zones. In other words, before separating the labels 18 from the web 31, the web 31 is printed, relative to each label 18, with at least one centering mark 24-30 positioned across  
10 two sides of the label 18 perpendicular to each other, in such a way as to touch, in the proximity of each of the sides, parts of the web 31 both inside and outside the label 18. This provides the certainty that, after separating the labels 18 from the web 31, the relative marks 24-30 in each label 18 are delimited by respective sides or edge zones of the label 18, whatever  
15 the position tolerances with which the marks 24-30 have been printed on the web 31 (obviously, it is assumed that these tolerances are not such as to shift the printing of the marks 24-30 completely outside or inside the labels 18).

The operating method described makes it possible to have with certainty  
25 the marks 24-30 of the labels 18 removed from the adjacent web 31 with two sides or edge zones of the label 18 perpendicular to each other, and therefore allows a reading of maximum precision to be performed of the position of these adjacent zones or edges of the marks 24-30, substantially coinciding with respective edges of the respective label 18,  
30 using control devices of the photocell optical type, shown schematically in the form of arrows in Figures 3-6 and denoted by the reference numeral

32. Obviously, the fact of performing the position control for each label 18 in two directions (those of the arrows 32 of each of the Figures 3 to 6) perpendicular to each other and perpendicular to two edges perpendicular to each other of the labels 18 allows a complete check to be made of the position of the labels 18 on the relative plane on which they lie.

During production of the cigarettes packet 1, each label 18 is firstly separated from the web 31 and connected to the sheet material which will form the inner wrapper 3, and then the sheet material is wrapped around a group 15 of cigarettes 16, with subsequent inclusion in the outer container

2. For this reason, the described position checking of the label 18 by optical reading of the marks 24-30 may be performed, as preferred, either when the sheet material which will form the inner wrapper 3 is still laid out on a plane, that is to say, not yet folded to form the wrapper 3, or on the wrappers 3 already formed and not yet enclosed in the respective outer containers 2.

It should be noted that, if preferred, the marks 24-30 might be printed on the label 18 using invisible ink, that is to say, not visible by the human eye with sources of light in the field of vision. More specifically, it is preferable that the ink used is visible under lighting within the ultraviolet or infrared range. The advantage, in this case, is both that of making the mark invisible and also preventing that the sensitivity of the control is influenced by the background colour, that is to say, the colour of the sheet material.

**CLAIMS**

1. A method for checking the position of an adhesive label on a sheet material, the sheet material forming or being designed to form, in particular, a wrapper (3) which is part of a cigarette packet (1), and the label (18) being applied to the sheet material after separation of the label from a web (31); the method being characterized in that it comprises, before separation of the label (18) from the web (31), the printing on the label (18) of at least a centering mark (33) extending as far as the outer perimeter of the label (18); the check of the position of the label (18) on the sheet material occurring through the detection of the position of the part of the perimeter of the label (18) on which the centering mark (33) extends.
2. The method according to claim 1, characterized in that, during the printing process, the centering mark (33) of the label (18) projects onto the web (31) beyond the outer perimeter of the label (18).
3. The method according to claim 1 or 2, characterized in that the centering mark (33) of the label (18) comprises at least one perimetric edge coinciding with a respective perimetric edge of the label (18).
4. The method according to any one of the preceding claims 1 to 3, characterized in that the centering mark (33) comprises a first and a second centering eye mark (24 to 30), said eye marks extending, respectively, as far as a first and a second perimetric edge of the label (18); said first and second perimetric edges starting from the same vertex of the label (18).
5. The method according to any one of the preceding claims 1 to 4, characterized in that the centering mark (33) comprises a first and a second centering eye mark (24 to 30), said eye marks extending, respectively, as far as a first and a second perimetric edge of the label (18); said first and second perimetric edges being substantially orthogonal relative to one another.
6. The method according to any one of the preceding claims 1 to 3,

characterized in that the centering mark (33) comprises a single centering eye mark extending as far as a vertex of the label (18) formed by a first and a second perimetric edge of the label (18).

7. The method according to any one of the preceding claims 1 to 3,  
5 characterized in that the centering mark (33) comprises a single centering eye mark extending as far as a vertex of the label (18) formed by a first and a second perimetric edge of the label (18); said first and second perimetric edges being substantially orthogonal relative to one another.

8. The method according to claim 6 or 7, characterized in that said single  
10 centering eye mark has a substantially triangular shape.

9. The method according to claim 6 or 7, characterized in that said single centering eye mark is substantially "L"-shaped.

10. The method according to any one of claims 1 to 9, characterized in that the centering mark (33) is printed using invisible ink.

15 11. The method according to any one of claims 1 to 9, characterized in that the centering mark (33) is printed using an ink which is visible under lighting within the ultraviolet or infrared range.

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FIG.1

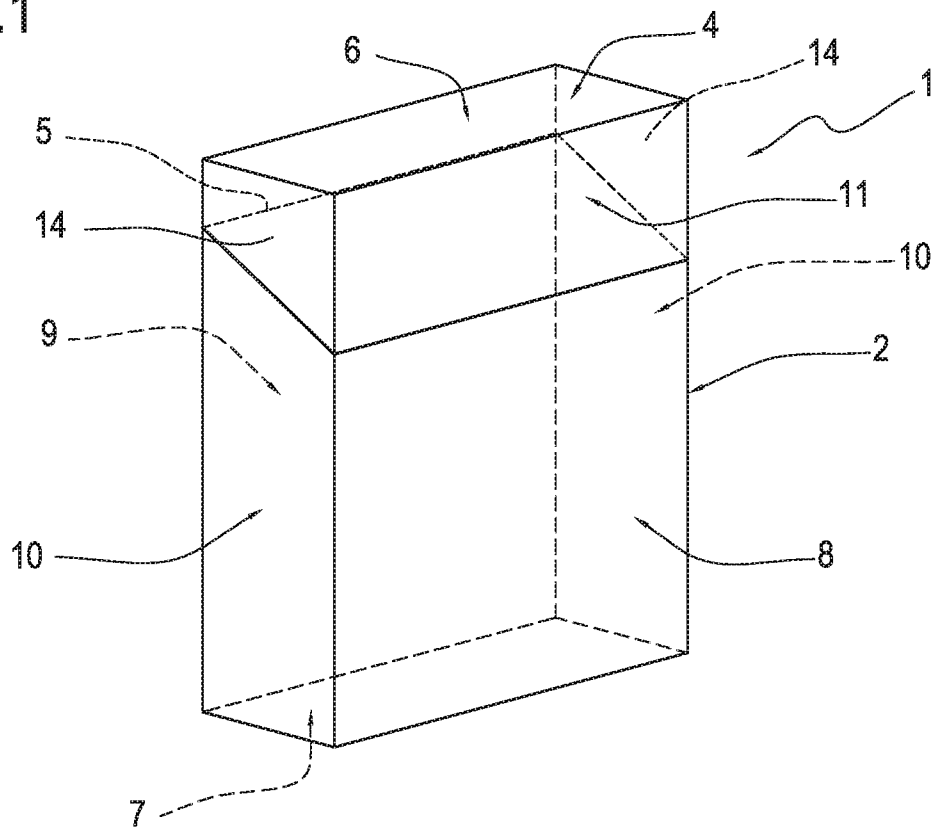
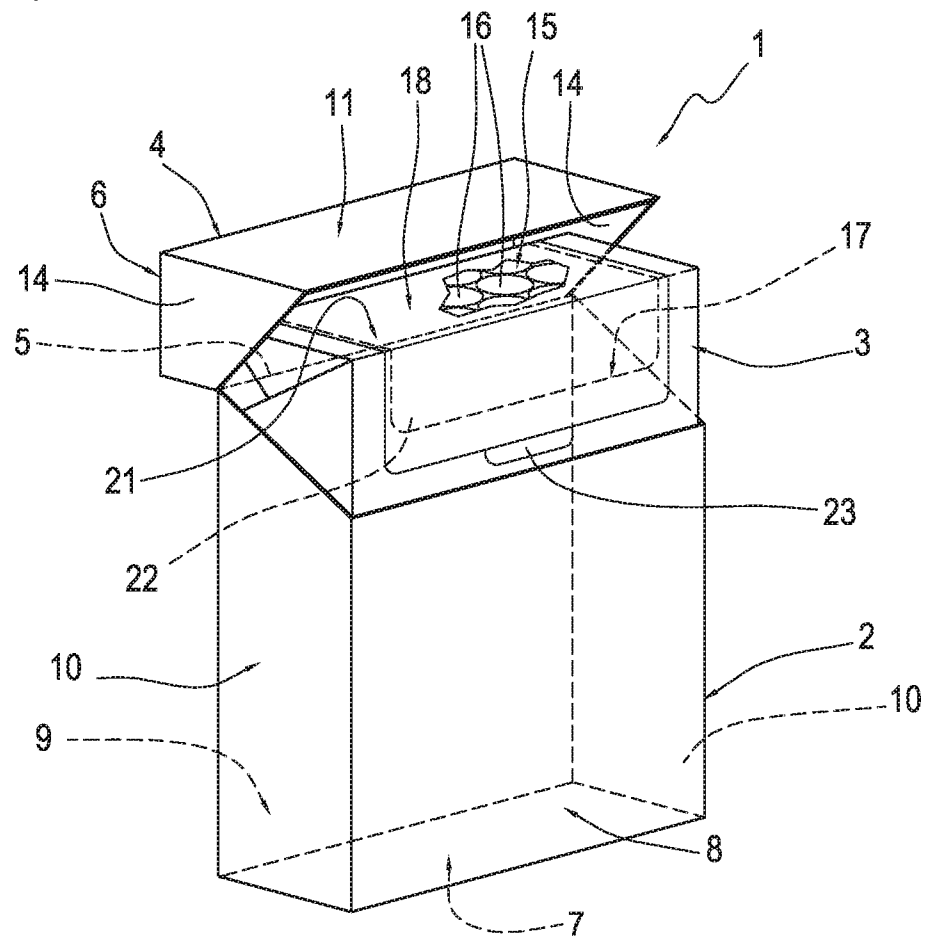


FIG.2



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FIG.3

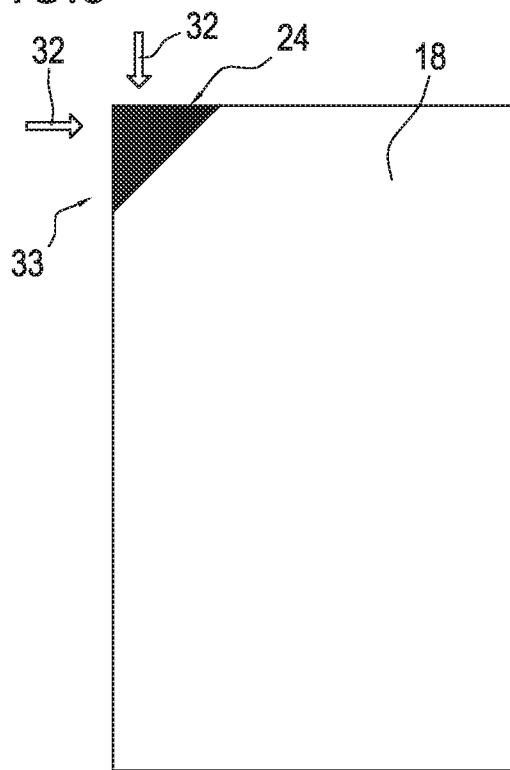


FIG.4

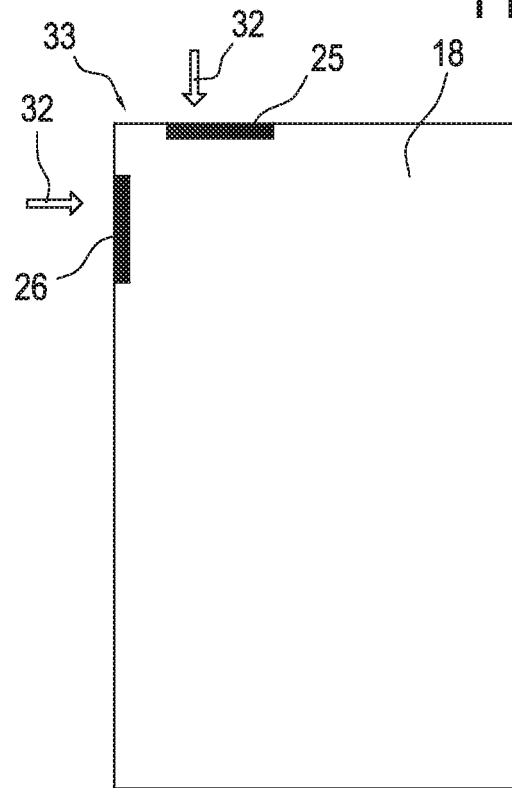


FIG.5

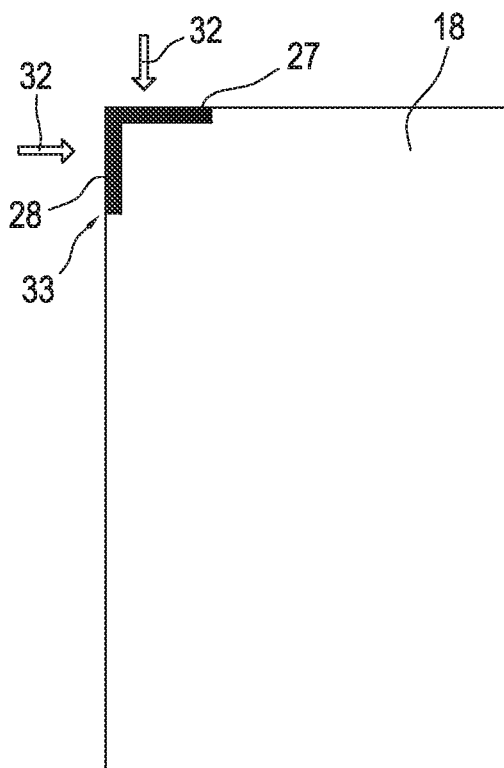
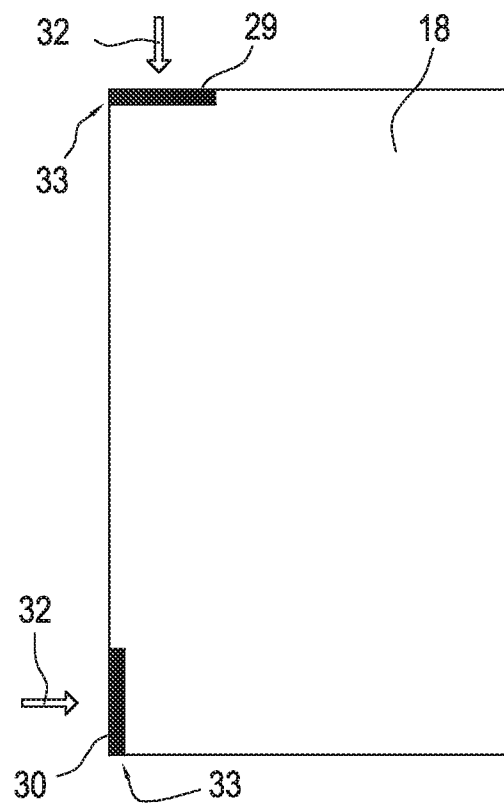
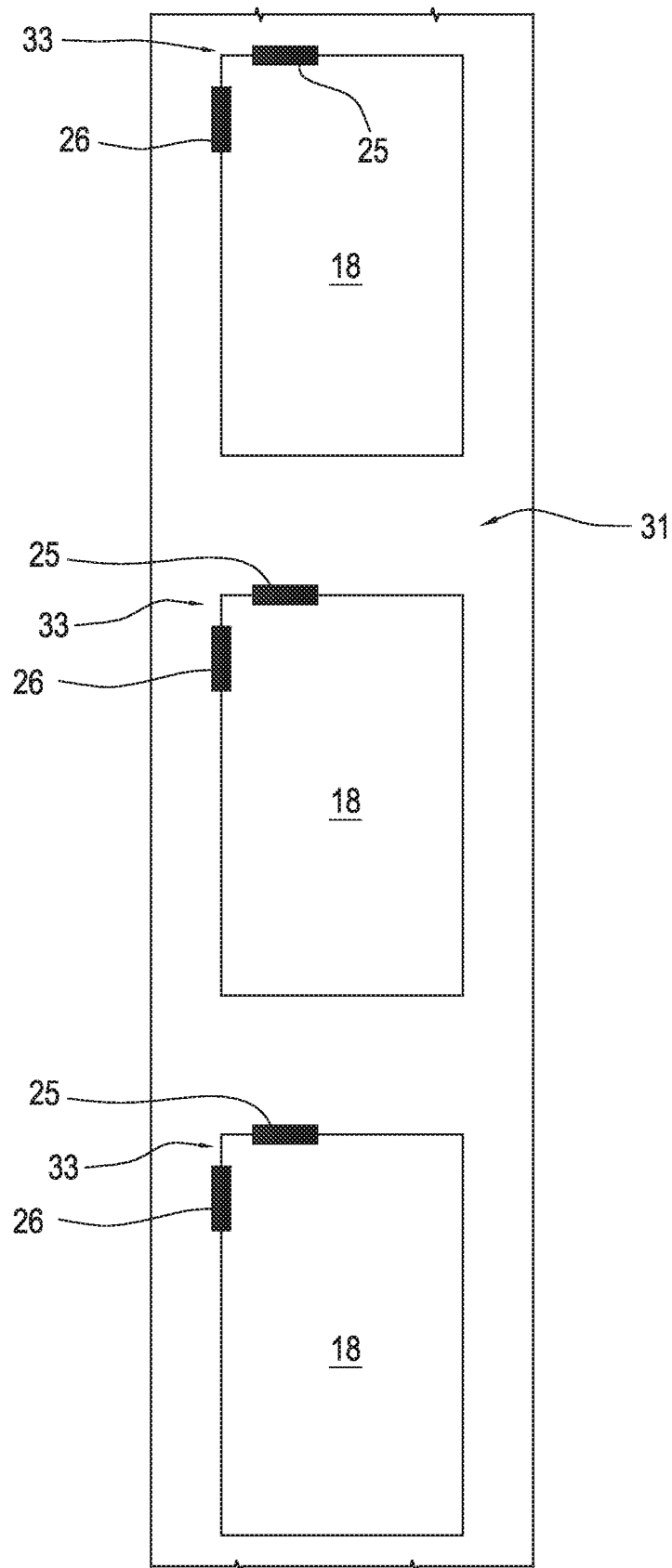


FIG.6



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FIG.7



## INTERNATIONAL SEARCH REPORT

International application No

PCT/IB2015/051366

## A. CLASSIFICATION OF SUBJECT MATTER

INV. B65C9/46

ADD.

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

B65C B65B

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

EPO-Internal

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

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Further documents are listed in the continuation of Box C.



See patent family annex.

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NL - 2280 HV Rijswijk  
Tel. (+31-70) 340-2040,  
Fax: (+31-70) 340-3016

Authorized officer

Wartenhorst, Frank

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/IB2015/051366

| Patent document<br>cited in search report | Publication<br>date | Patent family<br>member(s) | Publication<br>date     |
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